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Witmer Stone shows (Proc. Acad. Nat. Sci. Philadelphia, 1889,) that Sharpe has mistaken Verreaux's *Pratincola salax*, and that it is identical with *P. sybilla* Linne. *P. axillaris* Shelly may be a variety of the same.

Mammals.—Ryder (Proc. Am. Philos. Soc., XXVI., 1889) seeks the phylogeny of the mammalian sweat gland in the epidermal glands of the Batrachia. C. Hart Merriam (*North American Fauna*, No. 1; published by the U. S. Department of Agriculture) presents a revision of the North American pocket mice. With abundant material, he has recognized eighteen species, but has united the two genera *Perognathus* and *Cricetodipus*. Many changes in synonymy are noticeable. In a second paper (l. c., No. 2) the same author describes fourteen new species of mammals from North America, arranged in the genera *Onychomys*, *Arctomys*, *Lagomys*, *Spermophilus*, *Tamias*, *Nyctionomus*, and *Phenacomys* (nov.).

Beddard (Proc. Zoöl. Soc., London, 1889) describes the visceral anatomy and brains of the American tapir. He concludes that the American species is distinguished from the Indian by the absence of well marked *valvulæ conniventes*, the presence of a moderator band in the heart, the shape of the glans penis, and a more elongate cæcum sacculated by four bands. The cerebral convolutions are simpler in *Tapirus* than in other living *Perissodactyles*.

Dr. R. W. Shufeldt describes (Proc. Acad. Nat. Sci., Philadelphia, 1889) the skull in an embryonic specimen of the California wood-rat, *Neotoma fuscipes*.

Dr. Frank C. Baker describes (l. c.) the habits of the recently discovered round-tailed muskrat, *Neofiber alleni* True.

EMBRYOLOGY.

The Placentation of the Hedge-hog (*Erinaceus europæus*), and the Phylogeny of the Placenta.¹—Prof. A. A. W. Hubrecht has placed embryological students under great obligations to him for this admirable work upon the development of the hedge-hog. There is room, however, for very wide difference of opinion as to the significance of the facts recorded. While no one will probably be disposed

¹ *Quar. Jour. Mic. Sci.*, XXX., Pt. 3, 1889, pp. 283-404. Plates xv.-xxvii.

to question the primitive position in many features, especially so far as adult characters are concerned, of the hedge-hog and its insectivorous allies, the assumption that its placentation is primitive is a very different matter. While no one can help but admire the wonderful fidelity and care with which the facts of placental development are recorded, since the plates for histological details are simply unrivalled, the conclusion that the placentation of the hedge-hog is primitive is far from warranted.

So far from Prof. Hubrecht's assumption as to the primitive nature of this type's placenta being borne out by his facts, it is distinctly and emphatically negatived by them. In the first place, a "reflexa" such as is described by him is found in comparatively few forms. Moreover, such a development of the uterine mucosa is distinct evidence in favor of the conclusion that the placenta in forms having such a "reflexa" is specialized. In some rodents, man, possibly *Tamandua*, also *Erinaceus*, *Talpidae*, *Rhynchocyon*, in all of which it is pretty certain that the whole complex series of primary differentiations of the blastocyst or blastodermic vesicle are completed without the accompaniment of an excessively rapid growth in its size, such as occurs in the rabbit and opossum, where also there is either no reflexa formed, or traces only of such an organ are developed later. In the first-named forms there has occurred an adaptive abbreviation of the early processes of development, which have not supervened in the last two, or in the rabbit and opossum.

The peculiar mode of development of the hypoblast in the hedge-hog is again specialized and widely different from what it is in most rodents.

In the same way the site of the placenta and the germinal area are different from those of other types, and therefore specialized. In the first place, the embryo itself is formed at a point in the blastodermic vesicle which is exactly opposite its homologue in the rabbit, mouse, and rat, and probably even man, *Bradypus*, and *Tamandua*, as well as many carnivora. In these last-named it is formed in a dorsal position in the uterine lumen or just beneath the insertion of the mesometrium. In *Erinaceus* the embryo is formed at a point on the surface of the blastocyst diametrically opposite to the point of insertion of the mesometrium. The embryo in the first-named series therefore has its dorsal aspect coincident at first with that of the parent; in the hedge-hog that aspect coincides with the ventral aspect of the parent. The site of the attachment of the placenta is similarly reversed. In the majority of forms the position of the placenta is immediately beneath

the insertion of the mesometrium. In *Erinaceus* the placenta foetalis is affixed to the side of the lumen of the uterus diametrically opposite to the insertion of the mesometrium. The conclusion is therefore forced upon us that *there is no exact homology between the maternal portion of the placenta in the hedge-hog and that of the same part in the large majority of other mammalian types.* The name "trophoblast" which Hubrecht proposes for the "outer layer" of the blastocyst is exceedingly apt and convenient, while his elaborate studies as to the role it plays in the formation of the placenta, as well as its growth and fate, constitute a most valuable contribution to the embryology of the higher vertebrates. Nevertheless, one cannot help regretting that the obvious and clear homology of this layer with the serous envelope, subzonal membrane,—*Deckschicht* as this layer has been variously called,—has not been more strongly emphasized. Of such a homology there cannot be the slightest doubt; the only difficulty in making it out is due to the excessive concentration or abbreviation of the early stages of development already referred to. The modification of their early stages and their abbreviation in mammalia are also clearly adaptive and directly so under the influence of trophic stimuli, which differ very widely in character in the different mammalian orders. These differences are apparently due to the effects of what may, for want of a better phrase, be called the reciprocal trophic stimuli exerted reciprocally upon each other by the blastocyst and uterine walls in the different types during the initial stages of development. The variations in the differentiation and arrangement of the mucosa and its vessels in the different forms must have had something to do with the genesis of such different methods of differentiation of the primary stages of mammalian development. The expectation of ever unravelling the causes of such differences through a study of the early development of the foetus alone will be fruitless. The processes are in the clearest possible manner directly adaptive in certain very definite ways, which purely morphological study is utterly and forever incapable of explaining, and is no less irrational and absurd than to attribute such modification to the "action" of natural selection.—JOHN A. RYDER.